~	I	Brookhaven Nationa	l Laboratory	y/National :					
Subject: Number:	LS-PPS-0040	aser Area In Revision:		Test Effec	tivo.	4/13/0	1	D	age 1 of 6
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Prepared/ Approved B	M. Buckley y:	Prepared/ Approved	By:	S. Buda			Approved By:		
*Approval si	gnatures on file with master copy.	J.				I	1	Revision	Periodic Review Lo
Test Re	eason:				Test	Result:	□ Passe		☐ Failed
								zu	
						Type:	☐ Full	D: : 1	☐ Partial
Test Da						Time:		Finish	Time:
Tester Tester						stant 1:			
Tester	<u>. </u>				7 1001	cant 2.			
Preparat	ion/Prerequisites:								
□ Inform	n the experimenter that	a test of the	laser in	terlock	is bei	ng perf	ormed.		
	alified SDL laser operat								
	f each laser system as in			to place	the l	aser sys	tems in a "R	leady-l	Mode" where
the pow	er supplies will be on w	rith no laser o	output.						
	Place beam-dump/safeg	marde in plac	oa and E	2 ad Tag	n aact	lacaro	uitnut:		
	1			•				(MI L	I.)
☐ Ti-Sapphire laser (Titanium—Sapphire) - located in the Main Laser Hutch (MLH) ☐ Nd: YAG laser (neodymium:yttrium-aluminum-garnet) - Main Laser Hutch (MLH)									
	`				•	et) - Ma	ın Laser Hut	cn (M	LH)
	□ Excimer laser - End		`						
	□ Nd: YAG laser (neod	dymium:yttri	um-aluı	minum-	-garne	et) - Enc	d Station Las	ser Are	a (ESLA)
1	[Cagnah Cagnanaa]								
	[Search Sequence] Press the Start Search b	utton located	lingide	the FSI	ΓΔ				
-	ress the Start Scaren o	The start se				es ON			
	Exit the ESLA, close th						Button.		-
	,	Observe th		_					
		minimum (J			_
		Both "Lase	er Interl	ocked"	signs	comes	ON		_
2.	Open the door								
		Intermitten	t audibl	le alarn	n sour	nds for 5	5		
		seconds.	T . 1	1 1		. 0	E.E.		-
		Both "Lase			_		FF		
		icator c	omes	ON			-		
	Attempt to secure the E		• .	1		1			
		Cannot cor does not ac		search -	Lase	r interio	ock		
-	Reset Interlock fault	does not ac	iivate						-
_	Reset Interioek fault								
3.	Press the start search bu	itton Evit th	e FSI A	\ close	the d	oor and	wait		
<i>J</i>	r ross the start scarch of	The Start S							
		seconds or					11 10		
]	Press Complete Search								-
	•	Interlock do	es not a	activate	;				

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4.	Press the Start Search button. Exit the ESLA and close the door. Press the Complete Search Button. Open the door and close the door within the time-out period and press the Complete Search Button. The interlock does not activate	-
5.	Search and interlock the ESLA. Press the interlock OFF button The laser interlock drops out	
	Open the door.	_
	No audible warning sounds.	
	Interlock fault indicator does not come ON	- -
6.	At this time the ESLA should not be secured.	
•	Verify the Faults are cleared on the two YAG power supplies in the Main Laser Hutch (MLH)	_
	Verify Faults are cleared on the Ti-Sapphire power supply laser power supply in the Main Laser Hutch (MLH)	_
	Verify Faults are cleared on the Excimer power supply in the End-Station Laser Area (ESLA)	
	Verify Faults are cleared on the (ESLH)YAG power supply in the End-Station Laser Area (ESLA)	_
	The ESLA laser shutter is closed.	
7.	Attempt to open the ESLA shutter.	_
	The ESLA shutter does not Open.	_
8.	8.1) Secure the ESLA and MLH for laser operation (Assistant remains inside).	
	8.2) Request the laser operator to turn ON all of the laser power supplies that will be involved with this test and achieve a 'laser ready' state where no laser beam will be transmitted. 8.3) Open the ESLA laser shutter.	
	The ESLA shutter opens	_
	A short audible sound followed by a 2-second audible signal is heard	
	The 3 power supplies are ON in the MLH	_
	The Excimer power supply in ESLA is ON	
	The YAG power supply in ESLA is ON	_

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version by checking the document effective date on the NSLS QA website. Brookhaven National Laboratory/National Synchrotron Light Source SDL End Station Laser Area Interlock Test **Subject:** LS-PPS-0040 4/13/04 Page 3 of 6 Number: **Revision: Effective:** 9. [Pass Through] Press the Internal PASS-Through button. Open the door and exit the ESLA. The PASS Through button indicator comes ON The shutter remains open The 3 power supplies remain ON in the MLH The Excimer power supply in ESLA remains ON The YAG power supply in ESLA remains ON Close the door within the timeout period. Press the External PASS-Through button. The PASS Through button indicator goes out The shutter remains open The 3 power supplies remain ON in the MLH The Excimer power supply in ESLA remains The YAG power supply in ESLA remains ON Laser security remains active in ESLA 10. Press the External PASS-Through button. Open the door and enter the ESLA. The PASS Through button indicator comes ON The shutter remains open The 3 power supplies remain ON in the MLH The Excimer power supply in ESLA remains ON The YAG power supply in ESLA remains ON Close the door within the timeout period. Press the Internal PASS-Through button. The PASS Through button indicator goes out The shutter remains open The 3 power supplies remain ON in the MLH The Excimer power supply in ESLA remains ON The YAG power supply in ESLA remains ON Laser security remains active 11. [ESLA Laser Shutter Operation] Cycle the shutter Open/Close switch. The shutter opens and then closes with out

any hesitation.

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12.	Open the laser shutter.	Press the E	xternal P.	ASS-Throu	gh button,		
	Open the door, and beg				,		
	After no more then 45 s	seconds the	following	occurs:			
		An audibl	e warning	g sounds for	r 5 seconds		
		The interl	ock fault	LED comes	s ON		
		Laser Inte	rlock dro	ps out			
		The shutte	er closes				
		The 3 pov	er suppli	es remain (ON in the MLH		
		The Excir	ner powe	r supply in	ESLA Turns		
		The YAG	power su	ipply in ES	LA Turns OFF		
		Interlock	fault will	only reset v	when F-300 key		
		is turned					
13.	[Main Entrance Door] Search ESLA. Open th are ON.		er. Assu	re all laser	power supplies		
	Open the ESLA door.	An audibl	a warnin	g sounds for	r 5 saaands		
			•	LED comes			
					SON		-
		Laser Inte		ps out			
		The shutte			NI : 4l MI II		
		-			ON in the MLH		
		OFF	ner powe	r supply in	ESLA Turns		
			nower su	ipply in ES	LA Turns OFF		
			-		when F-300 key		
		is turned		only reserv	, 11011 1 200 110 1		
14.	[Roll-Up Door] Sear	rch the Lase	r ESLA.	Open the la	iser shutter.		
	Raise the roll-up door u	ip off of the	interlock	contact.			
		An audibl	e warning	g sounds for	r 5 seconds		
		The interl	ock fault	LED comes	s ON		
		Laser Inte	rlock dro	ps out			
		The shutte	er closes				
		The 3 pov	er suppli	es remain (ON in the MLH		
		The Excir	ner powe	r supply in	ESLA Turns		
		OFF					
		The YAG	power su	ipply in ES	LA Turns OFF		

Interlock fault will only reset when F-300 key

is turned

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15.	[Main I	Door – L	Oor Stop]
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Search the Laser ESLA. Open the laser shutter.

Raise the roll-up door approximately ½" to 1" off of the interlock switch.

An audible warning sounds for 5 seconds
The interlock fault LED comes ON
Laser Interlock drops out
The shutter closes
The 3 power supplies remain ON in the MLH
The Excimer power supply in ESLA Turns
OFF
The YAG power supply in ESLA Turns OFF
Interlock fault will only reset when F-300 key is turned

16. **[Reach-back]** Search the Laser ESLA. Open the laser shutter.

Insert a block in the opening of the laser shutter assembly to prevent the shutter from closing.

Open the main entrance door

An audible warning sounds for 5 seconds
The interlock fault LED comes ON
Laser Interlock drops out
The shutter closes
The 3 power supplies turn OFF in the MLH
The Excimer power supply in ESLA Turns OFF
The YAG power supply in ESLA Turns OFF

Reset Fault

17. [Lockout Switch]

Secure ESLA for laser & turn On power supply.

Open laser shutter.

Switch from "operate" mode to "Lockout" mode.

Interlock drops out.

The shutter closes

The 3 power supplies remain ON in the MLH The Excimer power supply in ESLA Turns OFF

The YAG power supply in ESLA Turns OFF

Interlock fault LED comes ON

Attempt to open shutter

Shutter will not Open

Reset interlock fault

Attempt to secure ESLA

ESLA security will not activate

Switch to "Operate" mode

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18.	[Emergency Stops]							
	Secure ESLA & turn	ON all laser po	ower sup	plies.				
	Open laser shutter. F	•	•	•	outton (ES#1).			
	•		_		in the MLH			
		-			SLA Turns O	FF		
			-		A Turns OFF			
		The shutter	closes					
		Interlock di	ops out i	n ESLA				
		Interlock fa	ult is ON	I				
		Intermittent	audible	alarm soun	ds for 5 secon	ds.		
		Interlock fa	ult will c	only reset w	hen F-300 key	is turned		
	Attempt to secure ES	SLA.						
		Laser secur	ity will n	ot activate.				
	Reset emergency stop	p.						
							ES#2	ES#3
19.	Secure MLH and EST power supplies.	LA with one pe	erson rem	naining insi	de & turn ON	all laser		
	Press the internal Em	nergency Stop b	utton.					
		The 3 power	r supplie	s turn OFF	in the MLH			
		The Excime	er power	supply in E	ESLA Turns O	FF		
		The YAG p	ower sup	oply in ESL	A Turns OFF			
		Interlock di	ops out i	n MLH				
		Interlock di	_					
		Interlock fa	ult is ON	1				
		Interlock fa	ult will c	only reset w	hen F-300 key	is turned		

* * *

Reset emergency stop.